DOCUMENT RESUME

ED 376 611 EA 026 330

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TITLE	Bridging the Gender Gap: How Girls Learn.
INSTITUTION	National Association of Elementary School Principals, Arlington, VA.
REPORT NO	ISSN-0735-0023
PUB DATE	Oct 94
NOTE	5p.
AVAILABLE FROM	National Association of Elementary School Principals, 1615 Duke Street, Alexandria, VA 22314-3483 (single copy, $2.50; 10 or more, $2 each).
PUB TYPE	Collected Works - Serials (022)
JOURNAL CIT	Streamlined Seminar; v13 n2 Oct 1994
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Educational Opportunities; Elementary Secondary Education; Equal Education; *Females; *Learning Processes; Mathematics Achievement; Science Education; *Sex Bias; Sex Differences; Sex Discrimination; *Sex Stereotypes; Socialization

ABSTRACT

This publication discusses the development of girls and women within a hierarchical power structure and the effects on their self-esteem and performance. It describes the differences between girls' and boys' learning styles and educational experiences, which have differential effects on self-esteem and performance, particularly in mathematics and science achievement. Girls face obstacles in the form of teacher bias, a socialization process that teaches passivity, and high schools that break up friendship networks. Public schools can replicate the experience of academically strong girls' schools by: (1) mandating teacher training about equity in the classroom; (2) incorporating teaching techniques that place more emphasis on collaboration and hands-on learning; (3) including women authors and heroines in assigned readings; and (4) using textbooks that depict women participating in science and historical events. A list of organizations that sponsor programs in support of girls' education is included. (LMI)

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ED 376 611

STREAMLINED SEMINAR

NATIONAL ASSOCIATION OF ELEMENTARY SCHOOL PRINCIPALS

VOLUME 13, NUMBER 2 OCTOBER 1994

Bridging the Gender Gap: How Girls Learn

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Judy Mann

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If you look at the development of girls and women within a hierarchical power structure, what seems to happen is this: Girls start full of enthusiasm, ready to climb. They have a developmental edge over boys from birth, and they score higher on standardized tests at the beginning of their education than boys do. They are generally more mature and ready to learn. But then something happens. When they leave high school, their scores on standardized tests are lower than boys'. Their loss of self-esteem is far more profound than boys'.

Where do they get derailed? How does it happen?

Learning Differences

People versus things. Trucks versus dolls. Motion and distance versus closeness and caretaking. These behavioral traits that are learned and reinforced throughout infancy and childhood reveal themselves as important influences on the way children learn.

Researchers Elizabeth Fennema and Penelope Peterson have suggested that learning habits that involve working independently on high-level tasks may enable some children to do better in math and science. These learning behaviors involve choosing what task to do and persisting at it until it is accomplished.

Of course, independence is precisely the quality that we promote in boys and discourage in girls. Young girls, Fennema and Peterson point out, are socialized to be dependent, and they receive more protection and more assistance in doing tasks from their parents and teachers. As a result of this social reinforcement, the researchers write, "when children enter school girls tend to be more dependent on others and boys tend to be more self-reliant."

They make the link between self-confidence and math competence this way: If you think you can do something, you'll do it. If you are confident that you can use and learn math, you will be inclined to take on a math task and persist at it until you have mastered it. Studies indicate that when it comes to mathematics, men attribute success to ability and effort, while women attribute success to unstable, external factors—like sheer luck—over which they have no control.

Judy Mann is a columnist for The Washington Post. *This article is excerpted from her book,* The Difference: Growing Up Female in America.

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How Schools Set Girls Up to Fail

In dozens of separate studies, researchers have found that girls receive less attention, less praise, less effective feedback, and less detailed instruction from teachers than do boys. Research by Myra and David Sadker, authors of *Failing at Fairness: How America's Schools Cheat Girls*, reveals:

- Teachers typically initiate more communication with boys than with girls in the classroom, strengthening boys' sense of importance.
- Teachers tend to ask boys more complex, abstract, and open-ended questions.
- In class projects and assignments, teachers are more likely to give detailed instructions to boys, and more likely to take over and finish the task for girls.
- Teachers tend to praise boys more often than girls for the intellectual content and quality of their work. They praise girls more often for neatness and form.
- When boys perform poorly, teachers often blame failure on lack of effort. Girls receive a different message whose implication is that effort would not improve their results.
- All too often, teachers and counselors track girls away from courses of study that lead to high-skilled, high-paying, high-technology careers.

(Source: *Shortchanging Girls, Shortchanging America*, American Association of University Women, 1994.)

The "Masculine" Subjects

Science and math are hard disciplines that are perceived by girls as cold, isolating masculine pursuits that are pointless and unrewarding for them. But we know that these subjects can be made more accessible and rewarding to girls when classroom teaching techniques make girls feel welcomed, when they are praised for good work, when they are made to feel valued and are supported by a network of family, advisers, teachers, and peers who share the conviction that math and science are as appropriate and important for women as they are for men.

To help demystify science, the American Association for the Advancement of Science has developed training programs whose aim is to get girls to make mistakes, try again, predict the outcome, find out why things happen, estimate, take risks, observe what is going on, ask questions, concentrate, explore, dig in—and get dirty.

Changing the System

We have known for more than a decade that gender bias is rife in America's classrooms and that it has a damaging effect on girls. We know that boys interrupt and command the attention of teachers while girls raise their hands politely and wait—often in vain—to be called upon. Day after day in classrooms all across the country, boys get substantially more "air time" than girls, and millions of girls are left to feel muted, invisible, and less important.

To intervene effectively and change the direction of girls' thinking, say the experts, we have to change just about everything in the current educational system. For example, textbooks and the way science is taught continue to relate to boys' activities and ways of learning over those of girls. Research has shown that girls are far more likely to answer "I don't know" when problems are posed using contexts that are familiar to boys and unfamiliar to girls.

Fennema and others have demonstrated repeatedly that there is a high correlation between students' achievement and how teachers treat them—with nonsexist teachers getting higher performance out of girls in math and science. Researchers have found that a lone teacher can have a significant impact on girls' attitudes toward math by providing active encouragement through role models, sincere praise for good work, and explicit advice regarding the value of math and its usefulness in high-paying careers.

The Girls' Network

During their elementary school years, most children spend their days in the same classroom with the same group and with the same teachers or teaching team. There is a reassuring constancy, a reliable structure. Then, just as they are about to reach puberty, they are dispatched out of the cocoon of elementary school and into

PROFESSIONAL ADVISORY

This article is in support of the following standard from *Proficiencies for Principals* (NAESP 1991):

Curriculum. The principal must assure that a multicultural, nonsexist, and developmentally appropriate program is provided for each child.

the cold, unfriendly halls of a new school, with six or seven different teachers, all of whom have different teaching styles, grading systems, homework demands, and project requirements. For many children this is the transition to hell, and study after study has shown that this is the period when the self-esteem of girls begins to plunge.

Educational strategies that take into account girls' core values of sharing and cooperation, as well as their need for close relationships with other girls, will produce a school environment that is more supportive of girls. Having other girls they know in their classes, particularly as they make the transition into junior high or middle school, is more important to girls' sense of security and confidence than many realize. Yet, many school systems move sixth graders into large middle schools, dislocating networks of friendships that form the nucleus of a peer support system that can give girls the courage to speak out, to raise their hands, and to risk an incorrect answer.

Resources

These organizations sponsor programs in support of girls' education:

The American Association of University Women
1111 16th St., N.W.
Washington, DC 20036

The Girl Scouts of the U.S.A.
830 Third Ave.
New York, NY 10022

Girls, Inc.
National Resource Center
441 West Michigan St.
Indianapolis, IN 46202

The National Coalition of Girls' Schools
228 Main St.
Concord, MA 01742

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Lessons from All-Girl Schools

All-girl schools expect a lot from their students, and they give them the self-confidence to expect a lot of themselves. These schools validate girls' learning style by teaching to their strengths. Whitney Ransome of the National Coalition of Girls' Schools believes that the poor retention rates for women in math and science are directly related to inhospitable teaching techniques and classroom environments that prevail in coeducational junior and senior high schools.

Traditionally math and science have been taught in ways that demand a right or wrong answer within a limited period of time, and each student is on his or her own to get the answer. However, research shows that girls learn better when they work together to solve a problem.

"Many of the math and science strategies we see being used throughout our schools value learning through cooperation and team exercises, realizing that there may be more than one right answer, and giving girls a lot of hands-on experience," says Ransome.

Girls are hungry for information that is relevant to their lives. Thus girls' schools use teaching strategies that relate math concepts to everyday uses, such as balancing checkbooks and managing homes. When teaching percentages, for example, teachers will have girls design the areas of a house, do architectural layouts, select building materials, and apply geometric concepts to such uses as wallpapering rooms.

How can public schools replicate the experience of academically strong girls' schools so that girls emerge feeling as confident and capable as boys? For starters, they can create a healthier atmosphere by mandating teacher training about equity in the classrooms. PTAs can pay for videotaping classrooms so teachers can see what they are doing. If educational research is any guide, even the most

progressive teachers will be stunned at the gender bias they see in their own teaching.

Public schools can also incorporate teaching techniques that place more emphasis on collaboration and hands-on learning, and less emphasis on competition.

Some other effective techniques that public schools can emulate:

- Be sure assigned reading includes women authors and heroines, and that the rite-of-passage stories so important to adolescents include girls as well as boys.
- Examine science texts to see that girls are shown doing experiments as often as boys.
- Check history books to see if they relate history to men, wars, elections, and economic cycles, or if they depict the history of an entire era, in which women play critical roles as pioneers, social reformers, inventors, and entrepreneurs.

A Commitment to Equity

Public schools and the communities they serve need to commit themselves to the proposition that all children deserve an equitable education, but reform will not come about until teachers, administrators, and school boards, as well as parents and children, develop a much deeper and broader understanding about how schools discriminate against girls.

Teachers will have to become sophisticated enough to spot gender discrimination in textbooks and to lead classroom discussions about it. They will also need to develop a teaching style that challenges both girls and boys to think, and enables each to express their thoughts in a variety of ways.

Guidance counselors must encourage girls to pursue physics, chemistry, and the higher levels of math. They need to join forces with faculty members to make sure that career days feature women scientists and mathematicians, and that girls are encouraged to attend summer science and math enrichment programs.

The goal should be to produce students—both boys and girls—who emerge from the educational process as leaders and as smart, confident, and kind people who will go on to create a society vastly improved over what we have now.

Streamlined Seminar (ISSN 0735-0023) is published six times during the school year by the National Association of Elementary School Principals. Single copies: $2.50; bulk orders (10 or more): $2.00 ea. Virginia residents add 4.5% sales tax. Specify date and title of issue when ordering. Checks payable to NAESP must accompany order. Send to Educational Products, NAESP, 1615 Duke Street, Alexandria, Virginia 22314.

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